

A study of complex network using hyperbolic triangle group

ABSTRACT

Complex network representing many real-world systems in nature and society have some common structural properties such as power-law degree distribution, small average path length and strong clustering coefficient. Recent research has hinted that networks that have an underlying hyperbolic geometry are able to capture these properties. In this research, we focused on constructing the complex networks using abstract mathematical structures constructed by tessellating the hyperbolic triangle group on the hyperbolic plane. We report here how we can use Mathematica to generate corresponding tessellation from the group generators using linear fractional transformations. We then develop a programme to extract and visualize the network hidden in the tessellation for several hyperbolic triangle groups.

Keyword: Complex network; Hyperbolic triangle group; Network